

IN THE CLAIMS:

Please CANCEL claims 5 and 13-20 without prejudice to or disclaimer of the recited subject matter.

Please AMEND claims 1, 2 and 6, ADD new claims 21-30, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Currently Amended) An alignment apparatus which generates a driving force between a plate-like movable element and a stator facing the movable element to control alignment of the movable element, said apparatus comprising:

movable element magnets which are arrayed in a plate-like plane of the movable element in accordance with an array cycle and are magnetized in predetermined directions;

stator coils which are arrayed at intervals corresponding to the array cycle; and

a current controller which supplies control currents having phase differences to each pair of adjacent ones of said stator coils to generate a driving force for driving the movable element between said movable element magnets and said stator coils facing said movable element magnets,

wherein said stator coils formed by stacking three pairs of the first and second layers generate translational driving forces with three degrees of freedom and rotational driving forces with three degrees of freedom between said movable element magnets and the stator coils of each layer facing said movable element magnets on the basis of the control currents.

2. (Currently Amended) The apparatus according to claim 1, wherein said stator coils are formed by stacking a plurality of first layers and a plurality of second layers,

each of the first layers comprising stator coils whose linear portions are arranged to extend in a first direction, and

each of the second layers comprising stator coils whose linear portions are arranged to extend in a second direction perpendicular to the first direction.

3. (Original) The apparatus according to claim 2, wherein the stator coil which constitutes one of the first and second layers generates a driving force with one degree of freedom between said movable element magnet and the stator coil facing said movable element magnet on the basis of the control current.

4. (Original) The apparatus according to claim 2, wherein said current controller supplies control currents having different polarities to the stator coils which constitute one of the first and second layers to generate translational and rotational driving forces with two degrees of freedom between said movable element magnets and the stator coils facing said movable element magnets.

5. (Canceled)

6. (Currently Amended) The apparatus according to claim 1, wherein an array of said movable element magnets ~~include~~ includes a plurality of defective portions which have no magnets.

7. (Original) The apparatus according to claim 1, wherein the plate like movable element has

a first region in which some of said movable element magnets are arrayed in the plane of the movable element; and

a plurality of projecting regions which externally project from the first region and in which remaining ones of said magnets are so arrayed as to face said stator coils.

8. (Original) The apparatus according to claim 6, wherein either of the projecting regions and defective regions are arranged at positions linearly asymmetric with respect to a central portion of the first region.

9. (Original) The apparatus according to claim 7, wherein said current controller supplies to said stator coils control currents for generating translational driving forces between said movable element magnets arrayed in the first region and said stator coils facing said movable element magnets to control a position of the movable element.

10. (Original) The apparatus according to claim 7, wherein said current controller supplies to said stator coils control currents for generating rotational driving forces between said magnets arrayed in the projecting regions and said stator coils facing said magnets to control a posture of the movable element.

11. (Original) The apparatus according to claim 1, further comprising a first partition structure which covers said stator coils and in which a coolant for cooling said stator coils can circulate.

12. (Original) The apparatus according to claim 1, further comprising:
first cooling means in which a coolant can circulate; and
second cooling means for transmitting heat of cooling of the coolant to said stator coils through a thermal conductor with which said second cooling means is filled to cool said stator coils.

13-20. (Canceled)

21. (New) An alignment apparatus which generates a driving force between a plate-like movable element and a stator facing the movable element to control alignment of the movable element, said apparatus comprising:

movable element magnets which are arrayed in a plate-like plane of the movable element in accordance with an array cycle and are magnetized in predetermined directions, wherein an array of said movable element magnets includes a plurality of defective portions which have no magnets, and either of projecting regions and defective regions are arranged at positions linearly asymmetric with respect to a central portion of the first region;

stator coils which are arrayed at intervals corresponding to the array cycle; and
a current controller which supplies control currents having phase differences to each pair of adjacent ones of said stator coils to generate a driving force for driving the movable element between said movable element magnets and said stator coils facing said movable element magnets.

22. (New) The apparatus according to claim 21, wherein said stator coils are formed by stacking a plurality of first layers and a plurality of second layers,

each of the first layers comprising stator coils whose linear portions are arranged to extend in a first direction, and

each of the second layers comprising stator coils whose linear portions are arranged to extend in a second direction perpendicular to the first direction.

23. (New) The apparatus according to claim 22, wherein the stator coil which constitutes one of the first and second layers generates a driving force with one degree of freedom between

said movable element magnet and the stator coil facing said movable element magnet on the basis of the control current.

24. (New) The apparatus according to claim 22, wherein said current controller supplies control currents having different polarities to the stator coils which constitute one of the first and second layers to generate translational and rotational driving forces with two degrees of freedom between said movable element magnets and the stator coils facing said movable element magnets.

25. (New) The apparatus according to claim 21, wherein said stator coils formed by stacking three pairs of the first and second layers generate translational driving forces with three degrees of freedom and rotational driving forces with three degrees of freedom between said movable element magnets and the stator coils of each layer facing said movable element magnets on the basis of the control currents.

26. (New) The apparatus according to claim 21, wherein the plate like movable element has

a first region in which some of said movable element magnets are arrayed in the plane of the movable element; and

a plurality of projecting regions which externally project from the first region and in which remaining ones of said magnets are so arrayed as to face said stator coils.

27. (New) The apparatus according to claim 26, wherein said current controller supplies to said stator coils control currents for generating translational driving forces between said movable element magnets arrayed in the first region and said stator coils facing said movable element magnets to control a position of the movable element.

28. (New) The apparatus according to claim 26, wherein said current controller supplies to said stator coils control currents for generating rotational driving forces between said magnets arrayed in the projecting regions and said stator coils facing said magnets to control a posture of the movable element.

29. (New) The apparatus according to claim 21, further comprising a first partition structure which covers said stator coils and in which a coolant for cooling said stator coils can circulate.

30. (New) The apparatus according to claim 21, further comprising:
first cooling means in which a coolant can circulate; and
second cooling means for transmitting heat of cooling of the coolant to said stator coils through a thermal conductor with which said second cooling means is filled to cool said stator coils.